



TASK ORDER (TO) 47QFCA23F0033 Modification P00002

Analytics Solution to Establish Real-Time Operational Information Dominance (ASTEROID)

in support of:

**United States (U.S.) Army Command,
Control, Computers, Communications,
Cyber, Intelligence, Surveillance, and
Reconnaissance (C5ISR) Center, Engineering
and Systems Integration (ESI) Directorate**

Awarded to:

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SECTION C – PERFORMANCE WORK STATEMENT

C.1 BACKGROUND

The Engineering and Systems Integration (ESI) Directorate, operating under U.S. Army Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Center serves as the U.S. Army's center for Research and Development (R&D) of advanced cyber operations; Electronic Warfare (EW); Signals Intelligence (SIGINT) technologies; Intelligence Processing, Exploitation, and Dissemination (PED); and information systems and processing. The United States (U.S.) Army faces new and varying threats from unconventional and asymmetric warfare that demand the need for capabilities to thwart these threat actions and allow Soldiers to stay steps ahead of adversaries. From initial concept through fielding, ESI supports full life cycle management of enterprise-scale systems and provides engineering support to Program Executive Offices (PEOs).

The global landscape of U.S. Army operations is entering a period of significant transition that is expected to accelerate over the next decade. This transition considers political and environmental factors and requires adaptability, sustainability, and innovation as strategic measures. ESI recognizes these transition changes and proposes a strategic focus to meet future challenges. This vision has been developed in close coordination with partner agencies and other ongoing C5ISR programs such as Army Research Laboratory (ARL), PEO Intelligence, Electronic Warfare and Sensors (IEW&S), PEO Command Control Communications - Tactical (C3T), and community-based Science and Technology (S&T) investment strategies in multiple areas as it relates to Multi-Domain Battle (MDB).

ESI's strategic vision is a core focus that maximizes the value of R&D through adaptable innovation. The concept of adaptable innovation allows for advancement specific to requirements and needs, independent of technological achievement. Technology is a driver for achieving capability and is one of several tools to achieve groundbreaking success. Breakthrough moments cannot be scheduled, and aiming for large technological success often requires long-term investment. By aligning the organization to requirements-focused development, innovation can occur and be adapted to meet the evolving needs of the U.S. Army. ESI's strategic vision encompasses full-spectrum combat operations as well as humanitarian missions, which typify force deployments.

C.1.1 PURPOSE

The purpose of this TO is to support ESI in R&D of system and system of systems engineering design to advance the next generation of U.S. Army analytic capabilities in C5ISR domains including all source, collection management, Cyber Intelligence (CYBINT), EW, SIGINT, Intelligence PED, and data analytics. This TO will develop and implement capabilities to fill urgent needs and support end user operational requirements. This TO will provide R&D services that include software engineering activities, post-production software engineering support, modernization technology insertion, Computer Software Configuration Items (CSCIs), nodes and user capabilities, and modifications unique to the Common Operating Environment (COE).

C.1.2 AGENCY MISSION

ESI provides the U.S. Army with effective intelligence and information warfare tools, guaranteeing Soldiers the information dominance needed on today's battlefield. The ESI mission is to research, develop, and evaluate Command and Control (C2); Intelligence, Surveillance, and

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Reconnaissance (ISR); EW; and cyber technologies to provide effective, proactive situational awareness, tracking, targeting, and survivability solutions that transition into operational relevant capabilities for the soldier. These activities will prepare capabilities for integration and operational deployment and maintain the Family of Systems (FoS) operational readiness for capabilities deployed to U.S. Army units and Department of Defense (DoD) programs.

C.2 SCOPE

The Analytics Solution to Establish Real-Time Operational Information Dominance (ASTEROID) scope will include program management and R&D services for complex system of systems architectures operating across multiple branches and operational theatres supporting National, Joint, and Tactical level intelligence operations and domains. R&D is defined as gathering knowledge to develop and design new products and discover new ways to improve existing products or services. The professional services will assist in maintaining the PEO IEW&S and PEO C3T FoS, also known as the COE, operational readiness for systems and capabilities deployed to various U.S. Army units and DoD programs. Long-distance travel in support of this TO is also anticipated for the deployment of personnel to various Continental United States (CONUS) and OCONUS locations, including multiple Combatant Commands (CCMDs), as required. Additionally, ASTEROID will require engineering services and analysis of new technology to be transferred to the Technology Insertion Transformation United Services (TITUS) TO for enterprise-wide integration and sustainment of new technology. There will be a need for coordination between TITUS and ASTEROID contractors working on these efforts. The Government will serve as an intermediate between the TITUS and ASTEROID TOs.

This TO does not include the direct acquisition of weapon systems on behalf of the DoD in accordance with the General Services Acquisition Manual (GSAM) 507.70. This acquisition does include IT supplies, services, and systems that may support a weapon system, which is part of a national security system (e.g., components, services to install and maintain weapon systems, ancillary supplies, and services).

C.3 CURRENT ENVIRONMENT

ESI is a directorate of the PEO for IEW&S, which works to outpace threats through technical excellence, adaptability, and solutions that support a broad range of operating environments. In addition to the ESI directorate, PEO C3T, PEO IEW&S, other DoD agencies, and program offices are looking for similar task areas to strengthen knowledge and drive technology insertion across the COE. These mission partners comprise a network of resources across the DoD to ensure that mission-critical technology is provided for consistency at an enterprise level, while minimizing individual program costs and long lead times for deliverables. Each mission partner has a unique mission, but ultimately, they share similar goals to obtain the most advanced technology for the program office needs. Other offices anticipated to receive support from the ASTEROID requirements include, but are not limited to these DoD mission partners:

- a. PEO Soldier has a need to conduct R&D, prototype development, and testing in order to deliver emerging technological capabilities to the Soldier, to include Artificial Intelligence (AI), data management and wireless capabilities, to ensure a lethal overmatch against current and future threats.
- b. PEO Simulation, Training, and Instrumentation (STRI) has a need to conduct R&D, prototype development, and testing to develop, deliver, and sustain testing, training, and

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information operations capabilities, which include employing AI and Machine Learning (ML) solutions. This will enhance readiness across the operational spectrum and utilize new technologies to modernize capabilities.

- c. Army G2 (Deputy Chief of Staff, Intelligence) has a need to conduct R&D, prototype development, and testing to continue providing oversight, training guidance, and foreign technical threat intelligence assessments in support of U.S. Army acquisition programs, science, and technology efforts, and R&D programs. This involves collaboration with DoD and Intelligence Community (IC) architects, prototype development of system of systems architectures, and supporting system and data interoperability.
U.S. Africa Command (AFRICOM) has a need to conduct R&D and prototype development and testing to strengthen security forces, respond to crises in order to advance U.S. National interests, and promote regional security, stability, and prosperity. Requirements include assisting with DoD Risk Management Framework (RMF), prototype Test and Evaluation (T&E), and configuration management services.
- d. U.S. Army Communications-Electronics Command (CECOM) has a need to conduct R&D, prototype development, and testing to sustain and deliver integrated C5ISR services for Soldiers, including maintaining communications systems in vehicles, administrative and technical support for C5ISR systems, and field support for modifications and upgrades.
- e. U.S. Army Combat Capabilities Development Command (DEVCOM) has a need to conduct R&D, prototype development, and testing to deliver emerging technology into existing systems. This is the next step in the U.S. Army's effort to transform its approach to modernize critical core capabilities that will give Soldiers a decisive edge in battle using research, development, and emerging technology.
- f. U.S. Army Intelligence and Security Command (INSCOM) has a need to conduct R&D, prototype development, and testing to synchronize and integrate emerging all-source intelligence and other specialized capabilities in support of U.S. Army, Joint, Coalition Commands, and the IC. INSCOM also requires on-site support for the testing of tools into existing systems and engineering and technical support services for intelligence applications.
- g. U.S. Special Operations Command (SOCOM) has a need to conduct R&D, prototype development, and testing to develop and employ fully capable Special Operations Forces to conduct global special operations and work to enhance the readiness of Special Operations Forces. This includes regular vulnerability research and reverse engineering of commercially available software and hardware to capitalize on current and emerging technologies used to support advanced analytics, while identifying and implementing appropriate performance solutions to improve productivity, reduce cost, and increase intelligence analyst effectiveness.

Currently, the approach for the U.S. Army Intelligence Digital Transformation Engineering Services (AIDTES) TO focuses on fielding, fixing, and modifying hardware and software. Where capabilities were once deployed in software development increments, the program's approach has transformed to an agile capability drop framework to provide:

- a. Improved usability and reliability.
- b. Enhanced visualization.
- c. Analytical tools and data integration.

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- d. Cyber analytics incorporation.
- e. Emerging cybersecurity considerations.
- f. Scalability by echelon.
- g. Alignment with the Intelligence Community (IC) Information Technology Enterprise (ITE).
- h. Open System Architecture.

C.4 OBJECTIVE

The objective of this TO is to provide the C5ISR Center, ESI, and Operations Intelligence Division (OID) with ongoing R&D services including system and software engineering, data access analysis, design, modeling and simulation, prototyping, development, integration analysis, Independent Verification and Validation (IV&V) testing, and software delivery to enhance the U.S. Army and DoD mission partners' system and analytic capabilities and interoperability.

Specifically, this includes the following objectives. The contractor shall:

- a. Conduct hardware and software R&D activities, accreditation activities, and tactical intelligence baseline testing.
- b. Conduct functional and performance initial prototype T&E and verify system functionality and interoperability.
- c. Create prototypes, test configuration solutions, and assess environment integration for current and future U.S. Army IT systems development for both tactical and strategic platforms.
- d. Analyze and test the technical necessity, accuracy, and completeness of proposed tactical intelligence system capability drops to ensure interoperability and continued system performance at required levels.
- e. Develop prototype technical manuals, quick reference guides, and prototype training to support system of systems integration.

C.5 TASKS

The following tasks are in support of this TO and are detailed below:

- a. Task 1 – Program Management
- b. Task 2 – Fundamental Scientific Research Services
- c. Task 3 – Progressive Engineering Lab Support
- d. Task 4 – Advanced Analytics Research and Development (R&D)
- e. Task 5 – Prototype User Guide/Training

C.5.1 TASK 1 – PROGRAM MANAGEMENT

The contractor shall provide program management support under this TO. This includes the management and oversight of all activities performed by contractor personnel, including subcontractors, to satisfy the requirements identified in this Performance Work Statement (PWS).

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The contractor shall facilitate Government and contractor communications and all activities necessary to ensure the accomplishment of timely and effective support, performed in accordance with the requirements contained in this contract.

The contractor shall conduct regular reviews of the Project Management Plan (PMP) as well as reviews of staff assignments, contractor's monthly progress, status, and financial reports with the ESI Technical Point of Contact (TPOC) and FEDSIM COR. The contractor shall provide and maintain a status list of Government-Furnished Property (GFP) (**Section J, Attachment I**). The contractor shall inform the FEDSIM COR and ESI TPOC of any technical, financial, personnel, or general managerial problems encountered throughout the contract's period of performance.

C.5.1.1 SUBTASK 1.1 – ACCOUNTING FOR SERVICE CONTRACT REPORTING

The contractor shall report ALL invoicing amounts and contractor labor hours (including subcontractor labor hours) required for performance of services provided under this TO for ESI via a secure data collection site. The contractor shall completely fill in all required data fields using the following web address: <https://www.sam.gov/content/entity-reporting>.

Reporting inputs will be for the labor executed during the period of performance during each Government Fiscal Year (FY), which runs October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported NLT October 31 of each calendar year. Contractors may direct questions to the support desk at <https://www.sam.gov/content/help>.

The Army Contractor Manpower Reporting System requirements apply to this effort and all manpower requirements shall be input into the DoD Enterprise Contractor Manpower Reporting Application (ECMRA) as required. To fulfill this U.S Army reporting requirement, the following ESI TPOC information is provided:

- a. The Unit Identification Code (UIC) for the ESI TPOC is: W4G8AA.
- b. The Federal Service Code (FSC) for the ESI TPOC is: AJ44.
- c. The Command Code for the ESI TPOC is: G.
- d. Fiscal Funding Station Code: S28043.

Contractors may use Extensible Markup Language (XML) data transfer to the database server or fill in the fields on the website. The XML direct transfer is a format for transferring files from a contractor's systems to the secure website without the need for separate data entries for each required data element at the website. The specific formats for the XML direct transfer may be downloaded from the web.

C.5.1.2 SUBTASK 1.2 – COORDINATE A PROJECT KICK-OFF MEETING

The contractor shall schedule, coordinate, and host a Project Kick-Off Meeting at a location approved by the Government (**Section F, Deliverable 02**). The meeting shall provide an introduction between the contractor personnel and Government personnel who will be involved with the TO. The meeting shall provide the opportunity to discuss technical, management, and security issues, and travel authorization and reporting procedures. At a minimum, the attendees shall include the contractor's Key Personnel, the ESI TPOC, other relevant Government personnel, the FEDSIM CO, and the FEDSIM COR.

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At least three workdays prior to the Project Kick-Off Meeting, the contractor shall provide a Project Kick-Off Meeting Agenda (**Section F, Deliverable 01**) for review and approval by the FEDSIM COR and the ESI TPOC prior to finalizing. The agenda shall include, at a minimum, the following topics/deliverables:

- a. Points of Contact (POCs) for all parties.
- b. Personnel discussion (e.g., roles and responsibilities and lines of communication between contractor and Government).
- c. Project Staffing Plan and status.
- d. Transition-In Plan (**Section F, Deliverable 04**) discussion.
- e. Security discussion and requirements (e.g., building access, badges, Common Access Cards (CACs)).
- f. Financial reporting and invoicing requirements.
- g. Quality Management Plan (QMP) (**Section F, Deliverable 05**).

The Government will provide the contractor with the number of Government participants for the Project Kick-Off Meeting, and the contractor shall provide copies of the presentation for all present.

The contractor shall draft and provide a Project Kick-Off Meeting Minutes Report (**Section F, Deliverable 03**) documenting the Project Kick-Off Meeting discussion and capturing any action items.

C.5.1.3 SUBTASK 1.3 – PREPARE A MONTHLY STATUS REPORT (MSR)

The contractor shall develop and provide a Monthly Status Report (MSR) (**Section F, Deliverable 06**). The MSR shall include, at a minimum, the following:

- a. Activities during the reporting period, by task (include ongoing activities, new activities, activities completed, and progress to date on all above-mentioned activities). Each section shall start with a brief description of the task.
- b. Problems and corrective actions taken. Also include issues or concerns and proposed resolutions to address them.
- c. Personnel gains, losses, and status (security clearance, etc.).
- d. Government actions required.
- e. Schedule (show major tasks, milestones, and deliverables; including planned and actual start and completion dates for each).
- f. Summary of trips taken, conferences attended, etc. (attach Trip Reports to the MSR for the reporting period).
- g. Financial report (found in Section C.5.1.10).

A sample MSR template is provided in **Section J, Attachment F**, that outlines the Government's minimum requirements. The MSR shall be in a format agreed upon by the ESI TPOC and FEDSIM COR. Any modifications, enhancements, or deviations from the provided MSR template shall be approved by the FEDSIM COR prior to submission.

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C.5.1.4 SUBTASK 1.4 – CONDUCT AND ATTEND PROGRAM MEETINGS

The contractor shall conduct, attend, and participate in various project- and program-related meetings. Meetings shall be conducted at either contractor or Government facilities. The project and program meetings shall include, at a minimum, the following:

- a. Technical Status Meeting (TSM): The contractor PM shall convene a monthly TSM with the ESI TPOC, FEDSIM COR, and other Government stakeholders (**Section F, Deliverable 07**). The purpose of this meeting is to ensure all stakeholders are informed of the monthly activities and MSR, provide opportunities to identify other activities and establish priorities, and coordinate resolution of identified problems or opportunities. The contractor PM shall provide a meeting minutes report of these meetings to the FEDSIM COR (**Section F, Deliverable 03**).
- b. Meeting/Conference Support/Technical Exchange Meetings (TEMs): ESI requests the contractor to organize, attend, and participate in meetings and conferences, program status, design, and production reviews in support of ESI's portion of PEO IEW&S and PEO C3T efforts and provide meeting, conference, progress, and status reports, as required (**Section F, Deliverable 09**). ESI requests the contractor to host meetings, conferences, and TEMs **at the contractors' facilities** within the local travel area of Aberdeen Proving Ground (APG) (6003 Combat Drive, APG, Maryland (MD) 21005) capable of supporting small (eight to ten person) to large (25 person) unclassified meetings. The meeting room/space shall be at no direct cost to the Government. ESI requests the contractor to attend, coordinate, and/or lead TEMs, focusing on those areas where technical exchange is necessary to ensure program interests are addressed. The contractor PM shall provide a meeting minutes report of these meetings to the FEDSIM COR (**Section F, Deliverable 03**).
- c. Program Management Review (PMR) meetings: The contractor shall conduct quarterly PMR meetings, focused on progress, task adjudication, and issues that may affect the overall program with the ESI TPOC, FEDSIM COR, and Government stakeholders (e.g., ESI, PEO IEW&S, and PEO C3T) (**Section F, Deliverable 11**). The PMR shall also report on staffing, financial status, and Technical Direction Plans (TDPs). As a part of the PMR, the contractor shall be prepared to explain the reasoning, assumption, and methodologies in arriving at particular conclusions, recommendations, or alternatives in the accomplishment of the tasks required by the TO. The contractor shall have Key Personnel available to support the PMR. Subcontractors shall attend PMR meetings when required to address key elements. The contractor shall prepare the PMR agenda, meeting reports, and presentation materials. The contractor PM shall provide a meeting minutes report of these meetings to the FEDSIM COR (**Section F, Deliverable 03**). PMRs shall be conducted quarterly; however, more frequent PMRs may be required.

C.5.1.5 SUBTASK 1.5 – PROVIDE MEETING REPORTS

The contractor shall submit meeting reports (**Section F, Deliverable 13**), as requested by the ESI TPOC and/or FEDSIM COR, to document meetings. The meeting reports shall include, at a minimum the following:

- a. Meeting attendees' names, contact information, and organizations represented.
- b. Meeting date and location.

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- c. Meeting agenda.
- d. Purpose of meeting.
- e. Summary of what transpired (issues and risks discussed, decisions made, and action items assigned).
- f. Conclusion.
- g. Recommendation(s).
- h. Next scheduled event(s) impacting or impacted by the meeting.

C.5.1.6 SUBTASK 1.6 – PREPARE AND UPDATE A PROJECT MANAGEMENT PLAN (PMP)

The contractor shall document all support requirements in a PMP (**Section F, Deliverable 14**) on which the Government will make comments. The final PMP shall incorporate the Government's comments.

The PMP shall:

- a. Describe the proposed management approach and contractor program organizational structure with roles and responsibilities.
- b. Contain detailed Standard Operating Procedures (SOPs) for all tasks.
 - 1. Include the contractor's operating procedures for managing, executing, and tracking multiple TDPs, long-distance travel, work hours, leave, staff training policies, and problem or issue resolution procedures.
- c. Include milestones, deliverables, tasks, and subtasks required in this TO.
- d. Provide for an overall Work Breakdown Structure (WBS) with a minimum of three levels and associated responsibilities and partnerships between Government organizations.
 - 1. The WBS shall identify all technical activities at a level of detail sufficient for the contractor to manage the work at no less than a weekly basis.
 - 2. Each WBS element shall be accompanied by a description, estimate of duration, and expected result(s).
- e. Describe in detail the contractor's approach to risk management under this TO.
- f. Describe in detail the contractor's approach to communications, including processes, procedures, format, and other rules of engagement between the contractor and the Government.
- g. Include the contractor's QMP for accomplishing TO performance expectations and objectives.

The PMP is an evolutionary document that shall be updated annually, at a minimum, and as project changes occur. The contractor shall work from the latest Government-approved version of the PMP.

C.5.1.7 SUBTASK 1.7 – TECHNICAL DIRECTION LETTER (TDL) AND TECHNICAL DIRECTION PLAN (TDP)

TDLs and TDPs are a means of communication between the FEDSIM COR, ESI TPOC, and the contractor to answer technical questions, provide technical clarification, and give technical direction regarding the content of the PWS. Technical direction means clarification of

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contractual requirements or direction of a technical nature, within the context of the PWS of the TO. In this capacity, the FEDSIM COR and ESI TPOC may provide technical direction to the contractor, so long as the technical direction does not make any commitment or change that affects price, quality, quantity, delivery, or other terms and conditions of the TO. As new TDLs are identified, the contractor shall provide initial estimates for Level of Effort (LOE) and schedules for completion. Once the FEDSIM CO authorizes work via a TDL, the contractor shall prepare a response to the TDL with a TDP. However, only the FEDSIM CO may authorize the implementation of the TDP, and the FEDSIM COR and ESI TPOC work within the limitations of the TDL. When necessary, the FEDSIM CO, in coordination with the FEDSIM COR and ESI TPOC, will provide the contractor with TDLs concerning details set forth in this TO subject to the following limitations:

- a. The TDL will be in writing, concurred to by the ESI TPOC and the FEDSIM COR, and approved by the FEDSIM CO prior to issuance of the TDL to the contractor. Any subsequent amendments to the TDL must be in writing and be concurred to by the ESI TPOC and FEDSIM COR prior to issuance of the TDL to the contractor. Written TDLs are the only medium permitted for use when technical direction communication is required. Any other means of communication are not permissible means of communicating technical direction during TO performance.
- b. Each TDL/TDP issued is subject to the terms and conditions of this TO and will not be used to assign new work, direct a change to the quality or quantity of supplies or services delivered, change the delivery date(s) or period of performance of the TO, or change any other conditions of the TO. TDLs/TDPs will only provide additional clarification and direction regarding technical issues. In the event of a conflict between a TDL/TDP and the TO, the TO will take precedence.
- c. Issuance of TDLs/TDPs will not incur an increase or decrease to the TO price, estimated TO amount (including fee), or TO funding, as applicable. Additionally, TDLs/TDPs will not provide clarification or direction of a technical nature that would require the use of existing funds on the TO beyond the period of performance or delivery date for which the funds were obligated.
- d. TDLs will provide specific technical direction to the contractor only for work specified in the PWS and previously negotiated in the TO. TDLs will not require new TO deliverables that may cause the contractor to incur additional costs. Additionally, TDLs will include an Organizational Conflict of Interest (OCI) statement and analysis to ensure alignment with the ASTEROID tasks and subtasks and OCI limitations.
- e. When, in the opinion of the contractor, a TDL calls for effort outside the terms and conditions of the TO or available funding, the contractor shall notify the FEDSIM CO in writing, with a copy to the FEDSIM COR, within two workdays of having received the technical direction. The contractor shall undertake no performance to comply with the TDL until the matter has been resolved by the FEDSIM CO through a TO modification or other appropriate action.

The TDL and TDP are evolutionary documents that shall be updated as requested, as elements of the project change.

The Government will communicate TDLs in writing that shall include, at a minimum the following information:

- a. TO number.

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- b. Date of TDL.
- c. TDL Identification (ID) number (coordinated between FEDSIM and the contractor).
- d. Severable versus non-severable determination.
- e. Planned start date and duration of the TDL.
- f. Reference to the relevant section or item in the PWS.
- g. Brief description of the work.
- h. Signature of FEDSIM CO, FEDSIM COR, Government Task Lead, and ESI TPOC.

The contractor shall prepare TDPs (**Section J, Attachment X**) in close coordination with ESI. The contractor shall provide the Government with a TDP (**Section F, Deliverable 16**) tailored to meet the requirements set forth in the Government's TDL. The contractor shall work from the Government developed TDL, and the TDP shall incorporate the Government's comments. The contractor-developed TDP shall include, at a minimum, the following information:

- a. Project scope.
- b. Project cost estimate (Rough Order of Magnitude (ROM)).
- c. Master Equipment List (MEL)/Bill of Materials (BOM) (if applicable).
- d. Project schedule including milestones, tasks, and subtasks required in this project.
- e. Project risks and mitigation.
- f. Project staff and resources.
- g. Estimated LOE by OASIS labor category including labor category number, Standard Occupational Classification (SOC) number, functional role, specialized training, and hours.
- h. Recommended performance criteria tied to the AFDP.
- i. Travel considerations.
- j. Project work products deliverables.
- k. Security considerations.
- l. WBS.
- m. Project transition.
- n. ESI customer feedback participation.
- o. Signature of the FEDSIM COR, Government Task Lead and ESI TPOC. The FEDSIM COR is expected to be the approving source for most TDPs, though the FEDSIM CO retains authority to approve specific TDPs if desired. The FEDSIM COR will consult the FEDSIM CO if there are significant questions about the TDP including scope fit to TDL.

Once the TDP has been approved by the FEDSIM COR, the contractor shall schedule and coordinate a TDP Project Kick-Off Meeting at a location approved by the Government at the Government's request. TDP Project Kick-Off Meetings may be held virtually pending approval from the FEDSIM COR. The meetings will provide an introduction between the contractor personnel and Government personnel who will be involved with the project. The meetings will provide the Government and the contractor with an opportunity to discuss technical, management, and security issues as well as other TO processes and procedures. At a minimum, the attendees shall include the contractor PM, relevant Government representative, the ESI TPOC, and the FEDSIM COR. The contractor PM shall provide a meeting minutes report of these meetings to the FEDSIM COR (**Section F, Deliverable 03**).

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C.5.1.8 SUBTASK 1.8 – OPERATIONS SCHEDULE

The contractor shall maintain and provide for review day-to-day work plans for activities by team members, including subcontractors. The contractor shall provide for regular reviews of management plans as well as reviews of resource assignments to the ESI TPOC, FEDSIM COR, and Government stakeholders (e.g., ESI, PEO IEW&S, and PEO C3T). The contractor shall develop an Operations Schedule (**Section F, Deliverable 18**) to assist with the overall orchestration of resources and efforts. The Operations Schedule shall remain up-to-date and ready for submission to the Government upon request. The Operations Schedule shall be reviewed for completeness in bi-monthly meetings with the Government. The Operations Schedule shall be in a format agreed upon with the ESI TPOC and FEDSIM COR. The Operations Schedule shall include, at a minimum, a method to track by task, brief task descriptions, a summary of tasks created and expected completion dates, and a list of assigned resources.

C.5.1.9 SUBTASK 1.9 – IMPLEMENT A TASK ORDER MANAGEMENT PORTAL

The contractor shall implement a contractor-hosted, web-based TO Management Portal capability that provides TO management views/reporting, tracks metrics, and stores artifacts at the unclassified level (**Section F, Deliverable 21**). The objective of the portal is to provide a central location for the Government and contractor to access management level information regarding the status and health of TO activities.

The contractor shall provide a portal that both Government-approved contractor personnel and Government personnel can access worldwide via unique user ID and password, as well as with a Personal Identity Verification (PIV) card and a CAC. The TO Management Portal shall be compliant with current and future DoD security standards and utilize a cloud-based solution available to users with a .mil and a .gov account. The contractor shall provide the ESI TPOC and the FEDSIM COR with a recommended portal strategy or solution at the Project Kick-Off Meeting. Once the FEDSIM COR provides the contractor with authority to proceed, the contractor shall proceed with implementing the approved solution in a timely and efficient manner.

The objective of the TO Management Portal is to introduce efficiencies and ensure coordinated service delivery worldwide. At a minimum, the TO Management Portal shall serve as a repository for all TDPs, TO deliverables, and data that is Government intellectual property as referenced in Section F. The portal shall include, at a minimum the following:

- a. A secure logical access controls with role-based views (e.g., FEDSIM COR, ESI TPOC, and tenant).
- b. A dashboard that identifies each TDP and includes the following:
 1. TDP ID number.
 2. Client name.
 3. TDP name.
 4. Abbreviated work description/scope.
 5. Client POC information.
 6. Contractor POC information.
 7. TDP start date.

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8. TDP end date.
9. TDP ROM.
10. Financial reporting including:
 - i. Approved budget by CLIN and funding document.
 - ii. Funded amount by CLIN and funding document.
 - iii. Incurred cost amount by CLIN and funding document.
 - iv. Invoiced amount by CLIN and funding document.
 - v. Burn rate by CLIN and funding document.
11. All maintenance data collected and reported.
12. Inventory status.
13. Summary of equipment under lease.
14. Retrograded equipment.
15. Equipment disposal.
16. Training (planned and completed).
- c. An automated workflow for the ESI TPOC(s) and FEDSIM COR to review and approve each Request to Initiate Purchase (RIP) (**Section J, Attachment N**), Travel Authorization Request (TAR) (**Section J, Attachment M**), Trip Report (**Section J, Attachment G**), and other deliverables. If the prime contractor does not have or loses approval of its purchasing system, the contractor shall submit a Consent to Purchase (CTP) (**Section J, Attachment O**) to the FEDSIM CO. The CTP replaces the RIP.
- d. The ability to view financial information to allow the Government to track the financial health of each effort. The Government will establish the level of granularity needed at the onset of an effort (e.g., funding document, travel and purchases receipts, line of accounting level). This shall be role-based for viewing and editing access.
- e. The ability to track all personnel supporting the TO by location and deployment status.
- f. An organized document library to store management-related deliverables (e.g., MSRs, RIPs, TARs, and PMP). The contractor shall submit final management-related deliverables into the Electronic Contract File (ECF) through the Assisted Acquisition Services (AAS) Assisted Service Shared Information SysTem (ASSIST) Post Award Collaboration (PAC) Tool NLT five workdays after acceptance by the FEDSIM CO or FEDSIM COR.
- g. The ability to store historical data consisting of up to one Terabyte of data, with a minimum of 1,500 data elements.
- h. The ability to perform data analysis, as required.

The portal shall be operational by the end of the contractor-defined transition-in period. The portal capabilities are expected to evolve and adapt to meet the Government's mission and reporting requirements. All Government information shall be downloadable and extractable, for a specific date or range of dates, in Microsoft (MS) office or Portable Document Format (PDF).

The contractor shall mark all artifacts and deliverables stored in the TO Management Portal to indicate authorship by contractor (i.e., non-Government) personnel; provided, however, that no deliverable shall contain any proprietary markings inconsistent with the Government's data rights set forth in this TO. The Government reserves the right to treat non-conforming markings in accordance with DFARS 252.227-7013 and 252.227-7014.

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C.5.1.10 SUBTASK 1.10 – FINANCIAL REPORTING

The contractor shall provide a Financial Report (**Section F, Deliverable 22**) with every MSR. The Financial Report shall include, at a minimum, the following, which shall be specified at the TDL, CLIN, and funding document level:

- a. Identification of the funding source.
- b. Monthly expenditures from the start of the period of performance.
- c. Project monthly expenditures and labor hours starting with the current month through the end of the period of performance.
- d. Funded levels on the TO by agency.
- e. Labor hours incurred to date on the TO by agency.
- f. Cost incurred by TDL, CLIN, and funding document.
- g. Accumulated invoiced cost by TDL, CLIN, and funding document up to the previous month.
- h. Projected cost by TDL, CLIN, and funding document for the current month.
- i. Funds remaining by TDL, CLIN, and funding document.
- j. Diagram reflecting funding and burn rate by month for the TO at the agency-level.
- k. Cumulative invoiced amounts for each CLIN up to the previous month.
- l. Estimated burn rate and project duration.

The contractor shall present a draft Financial Report format at the Project Kick-Off Meeting for Government review. The Government will provide written approval of the proposed format via the FEDSIM CO or FEDSIM COR, and this approved format shall be utilized for the monthly Financial Report requirement. The Government may request updates to the format based on ESI requirements and Agency needs. Any changes to the format will be requested in writing via the FEDSIM CO or FEDSIM COR.

C.5.1.11 SUBTASK 1.11 – PREPARE TRIP REPORTS

The Government will identify the need for a Trip Report (**Section F, Deliverable 23**) when the request for travel is submitted. The contractor shall keep a summary of all long-distance travel including, but not limited to, the name of the employee, location of travel, duration of trip, and POC at travel location. Trip reports shall also contain Government approval authority, total cost of the trip, a detailed description of the purpose of the trip, and any knowledge gained. At a minimum, Trip Reports shall be prepared with the information provided in **Section J, Attachment G**.

C.5.1.12 SUBTASK 1.12 – PROVIDE QUALITY MANAGEMENT

The contractor shall identify and implement its approach for providing and ensuring quality throughout its solution to meet the requirements of the TO. The contractor shall provide a QMP and maintain and update it as changes in the program processes are identified (**Section F, Deliverable 05**). The contractor's QMP shall describe the application of the appropriate methodology (e.g., quality control and/or quality assurance) for accomplishing TO performance expectations and objectives. The QMP shall describe how the appropriate methodology integrates with the Government's requirements.

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C.5.1.13 SUBTASK 1.13 – TRANSITION-IN

The contractor shall provide a final Transition-In Plan (**Section F, Deliverable 04**) as required in Section F within five calendar days after the Project Kick-Off Meeting. The contractor shall ensure that there will be minimum service disruption to vital Government business and no service degradation during and after transition-in. The contractor shall implement its Transition-In Plan when the Government accepts the Transition-In Plan as final and all transition activities shall be completed 90 calendar days after Project Start (PS).

During the transition-in period, the contractor shall prepare to meet all TO requirements and ensure all incoming personnel are trained and qualified to perform. During the transition-in period, the contractor's personnel shall interface with Government personnel and other contractor personnel for purposes of transferring knowledge, lessons learned, and continuity of information and documents for the commencement of performance.

C.5.1.14 SUBTASK 1.14 – TRANSITION-OUT

The contractor shall provide transition-out support when required by the Government. The Transition-Out Plan shall facilitate the accomplishment of a seamless transition from the incumbent to incoming contractor/Government personnel at the expiration of the TO. The contractor shall provide a Transition-Out Plan NLT 120 calendar days prior to expiration of the TO (**Section F, Deliverable 24**). The contractor shall review and update the Transition-Out Plan in accordance with the specifications in Sections E and F.

In the Transition-Out Plan, the contractor shall identify how it will coordinate with the incoming contractor and/or Government personnel to transfer knowledge regarding the following:

- a. Project management processes.
- b. POCs.
- c. Location of technical and project management documentation.
- d. Status of ongoing technical initiatives.
- e. Appropriate contractor-to-contractor coordination to ensure a seamless transition.
- f. Transition of Key Personnel roles and responsibilities.
- g. Schedules and milestones.
- h. Long lead items, deliveries, and mitigations.
- i. Actions required of the Government.

The contractor shall also establish and maintain effective communication with the incoming contractor/Government personnel for the period of the transition via weekly status meetings or as often as necessary to ensure a seamless transition-out. All facilities, equipment, and material utilized by the contractor personnel during performance of the TO shall remain accessible to the contractor personnel during the transition-out period pursuant to the applicable security in-processing and out-processing guidelines.

C.5.2 TASK 2 – FUNDAMENTAL SCIENTIFIC RESEARCH SERVICES

The Multi Domain Operation (MDO) environments and adversary technical capabilities constantly change. The rate of change, combined with technical complexity, mandates a hybrid environment of Government, academic, and commercial resources operating collaboratively to

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address mission-critical needs and retain dominance in the battlespace. The contractor shall accomplish the following under this task:

- a. Provide R&D services for data engineering across DoD data-centric programs and developmental projects, ontology development (set of concepts and categories in a domain that show their properties and the relations between them), data modeling, data correlation, data fusion, and data mediation within system solutions.
- b. Provide component development for transition engineering services and interoperation hardware and software components.
- c. Conduct accreditation activities of systems across multiple networks including identifying, assessing, analyzing, documenting, and auditing Information Assurance (IA) requirements and capabilities through the RMF accreditation process in accordance with National Institute of Standards and Technology (NIST) RMF publications, such that authorizations and certifications are obtained and maintained as needed for each system.
- d. Provide IV&V testing to confirm requirements are defined and the system implements the required functionality and security requirement.
- e. Provide final software prepared for use in accordance with the Configuration Management Plan (**Section F, Deliverable 25**) and final software delivery compliant with the initial prototype T&E Master Test Plan (**Section F, Deliverable 26**).
- f. Provide Scientific and Technical Reports that may include software performance metrics and results (**Section F, Deliverable 27**).

C.5.2.1 SUBTASK 2.1 – DATA ENGINEERING, ONTOLOGY, AND DATA FUSION

This subtask shall provide R&D services for data engineering, ontology development, data modeling, data correlation, data fusion, and data mediation within enterprise-scale system solutions supporting high data velocity and data volume (streaming multimodal sensor data (e.g., Moving Target Indicator (MTI), Full-Motion Video (FMV), and SIGINT). The contractor shall leverage disparate data for ML and analytics applications.

The contractor shall provide the following data engineering, ontology, and data fusion support:

- a. Plan, design, develop, verify, validate, execute all functional and performance testing, and facilitate collaborative data engineering efforts across DoD data-centric programs and developmental projects.
- b. Implement scalable data platforms using Commercial Off-The-Shelf (COTS)/open-source technologies that follows applicable data handling requirements, mitigates risk naturally inherited through data aggregation efforts, and accelerates the development of descriptive, predictive, and prescriptive analytics/visualizations.
- c. Test the integration of disparate data sources at the system level.
- d. Analyze roadmap dependencies (**Section F, Deliverable 28**), probabilistic critical paths, and cost/schedule risk or technologies and their interdependencies; aggregate end user capability set schedules (including integration and reset activities) to explore tradeoffs and optimize modernization activities across portfolio of technologies. Results of these analyses should be supported with Joint Confidence Levels around the roadmap's cost and schedule parameters, prioritized risk mitigation strategies, and cost-benefit-analysis of executing identified strategies.

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C.5.2.2 SUBTASK 2.2 – COMPONENT DEVELOPMENT FOR TRANSITION ENGINEERING

This subtask shall provide transition activities required to move from the development phase in a R&D life cycle (i.e., research, design, develop, integrate, test, and disseminate) to the fielding and sustainment phase. The contractor shall assist in scheduling activities with required personnel for installation and support and identify required resources during transition.

The contractor shall provide the following component development for transition engineering support:

- a. Develop interoperating hardware and software components that include a regimented approach to installation and maintenance that mitigates risks, captures detailed configurations, and operates under a flexible system management methodology, while ensuring that the binaries and configuration files are compiled, controlled, and released by a single release authority.
- b. Assist with the post-deployment software sustainment and post-production software sustainment requirements, management, and execution for established programs of record.
- c. Identify, manage, and mitigate the risks associated with transitional engineering for complex systems.
- d. Facilitate collaborative engineering efforts across multiple contractor resources and Government agencies and proactively manage transitional engineering execution.
- e. Assist with the transition to automated tools.
- f. Update the Interface Control Document (ICD) (**Section F, Deliverable 30**) and the Software Design Description (SDD) (**Section F, Deliverable 29**) during transition.
- g. Document component development, transition activities, conduct engineering gap analysis, operational gap analysis, configuration management alignment, and information transition (**Section F, Deliverable 27**).
- h. Conduct planning and prototype training support for fielding systems on an as-required basis.

C.5.2.3 SUBTASK 2.3 – ACCREDITATION

This subtask shall provide cybersecurity accreditation operations, including risk management activities, which include authorizations, risk assessments, and threat assessments following DoD and IC specific guidelines for RMF and processes; security engineering and design guidance services; implementation of automated testing and validation capabilities in collaboration with software developers; cross-domain solutions security administration and engineering services; acceptance of Assessment and Authorization (A&A) packages (**Section F, Deliverable 31**) and requirements via eMASS, Xacta, FedRAMP systems for RMF documentation submission.

The contractor shall utilize the RMF, DoD Instruction (DoDI) 8510, to conduct activities for accreditation of systems and provide the following support:

- a. Identify, assess, analyze, document, and audit IA requirements and capabilities for PEO IEW&S and PEO C3T FoS such that Authorization to Operate (ATO), and interim authorizations (e.g., Interim Authorization To Test (IATT)) are obtained and maintained

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as needed for each system implementation regardless of location and authorized approving authority (**Section F, Deliverable 32**).

- b. Utilize the RMF to identify, track, and manage risk to achieve and maintain appropriate IA posture for all locations and networks (e.g., Non-classified Internet Protocol Router Network (NIPRNet), Secret Internet Protocol Router Network (SIPRNet), Joint Worldwide Intelligence Communications System (JWICS), and partner nations networks).
- c. Identify, assess, analyze, document, and audit IA requirements and capabilities for the U.S. Army tactical and strategic systems through the RMF accreditation process.
- d. Conduct accreditation activities across the NIPRNet, SIPRNet, JWICS, and National Security Agency Network (NSANet) enclaves.

C.5.2.4 SUBTASK 2.4 – INDEPENDENT VERIFICATION AND VALIDATION (IV&V) TESTING

This subtask shall provide a comprehensive review, analysis, and testing, (for software and/or hardware) to ensure the requirements are correctly defined and confirm that the system correctly implements the required functionality and security requirements.

The contractor shall provide the following IV&V testing:

- a. Develop and provide IV&V testing to confirm (i.e., verify) the requirements are correctly defined and to confirm (i.e., validate) the system correctly implements the required functionality and security requirement.
- b. Provide Subject Matter Expert (SME) engineering services with experience and knowledge of National Security Agency (NSA) Information Assurance Security Requirements Directive (IASRD) document and its derivative Contract Data Requirement Lists (CDRLs).
- c. Conduct an evaluation of system design, architecture, formal documentation, and source code associated with products undergoing formal NSA high assurance certification.
- d. Deliver automation solutions that accelerate the security accreditation and IA process.
- e. Provide SME engineering services with the implementation of Development, Security and Operations (DevSecOps) best practices including version control, application development, security compliance, and infrastructure deployment automation providing production capable Continuous Integration/Continuous Deployment (CI/CD) pipelines.
- f. Provide SME engineering services with the implementation of Infrastructure as Code (IaC) (e.g., Terraform, CloudFormation, and Ansible) to deploy infrastructure in an automated fashion in physical, in-person, and cloud environments.

C.5.2.5 SUBTASK 2.5 – FINAL SOFTWARE DELIVERY

This subtask shall provide final software delivery support. The software must be prepared for use in accordance with the Configuration Management Plan and the software must be in compliance with the initial prototype T&E Master Test Plan. A Software Version Description must be prepared for each software delivery, including to the sustainment site.

The contractor shall provide the following final software delivery support:

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- a. Prepare and provide the Government with final copies of all software developed on this effort (**Section F, Deliverable 12**), with all source code documentation, source, object, executable, and delivered via a transfer medium determined by the ESI TPOC.
- b. Develop and update the technical and software user manuals including the final design document and operating instructions, operator's quick reference guide, and technical data for provisioning, such that the documents reflect the required configuration as delivered (**Section F, Deliverable 34**).
- c. Develop and update the configuration guides prototype training materials (**Section F, Deliverable 35**) including, but not limited to, system configuration guides, system check out guides, post clone guides, and user manuals for the system such that the documents reflect the required configuration as delivered.
- d. Update technical documentation for items comprising Modification Work Order (MWO) kits that will need to be provisioned by the Government in the future. Provisioning updates shall include drawing changes to accommodate design changes.
- e. Provide the following deliverables that support the final software delivery subtask:
 1. Software Production Specifications (SPS) (**Section F, Deliverable 33**).
 2. Software Test Report (**Section F, Deliverable 36**).
 3. Software Requirements Specification (SRS) (**Section F, Deliverable 37**).
 4. Software Version Description (**Section F, Deliverable 38**).
 5. Software Test Plan (STP) (**Section F, Deliverable 39**).
 6. Software Test Description (**Section F, Deliverable 40**).
 7. Interface Requirement Specification (IRS) (**Section F, Deliverable 41**).
 8. Computer Software Product End Items (**Section F, Deliverable 42**).

C.5.3 TASK 3 – PROGRESSIVE ENGINEERING LAB SUPPORT

Contractor support of this task shall provide a lab synchronization engineering process that ensures daily inventory of software between unclassified and classified labs and the synchronization of multi-lab integration activities. This includes the management, creation, configuration, testing, and maintenance of complete environments for current and future U.S. Army IT system development on tactical and strategic platforms.

The contractor shall provide input into the establishment and support of the baseline reference environment for future software releases' formal integration and acceptance testing. The contractor shall provide the following progressive engineering lab support for R&D:

- a. Provide and maintain an unclassified lab at the contractor facility at no direct cost to the Government with a Virtual Private Network (VPN) connection to the ESI Software Integration Laboratory (SIL) for initial prototype T&E activities and final software delivery.
- b. Develop and utilize a technology capability incubation process that fosters emerging capabilities to enable the intelligence analyst to leverage advanced analytics to efficiently exploit intelligence information.
- c. Create, configure, test, and maintain complete integration environments for current and future U.S Army IT systems development. This support shall include the maintenance of the tactical and strategic platforms.

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- d. Create an environment to develop, test, and execute an integration process to support the current software release, integration of new or updated components, and facilitation to create and test stable and deployable releases.
- e. Advance and facilitate software integration analysis, testing, and reporting.
- f. Support the maturation and facilitation of software integration analysis and reporting through assessments of Government-provided products to validate whether the product and integration meets the objectives of ESI.
- g. Configure, test, and operate a complex FoS from the contractor lab facilities.
- h. Plan, design, develop, verify, validate, and execute all functional and performance testing of the complete software baseline.
- i. Conduct daily backups and provide no less than 30 calendar days of off-site storage to restore files, software baselines, and/or entire in-person machines.
- j. Provide the ability to restore from backup any file, software baseline, and/or entire in-person machine within 24 hours of request.
- k. Conduct active cyber monitoring, including no less than 90 calendars days of logging that is to be made available to authorized users for auditing.
- l. Ensure VPN systems are operational and accessible 24 hours per day, seven days per week, excluding downtime for systems and circuits that is out of the contractor's control.
- m. Utilize a designated unclassified VPN environment for remote access of software vendor development, integration, and testing prior to delivering software to ESI SIL environment.

C.5.4 TASK 4 – ADVANCED ANALYTICS RESEARCH AND DEVELOPMENT (R&D)

The contractor shall provide the following services in support of this task:

- a. Provide ML, cognitive computing, and AI R&D including supporting the physical production, engineering, and assessment facilities; serving Government interests; and advancing early assessment, prototyping, and integration analysis of commercial, academic, and Government innovations.
- b. Provide solutions that reduce Government risk and accelerate warfighter capabilities using commercial prototypes, proofs of concepts, and solutions.
- c. Provide PED mission support including conducting analysis, development, initial integration, and testing to identify and mature emerging PED analytic capabilities from industry, Government, and academia.
- d. Provide advanced cloud technology (i.e., evolution of cloud technology and its applications to the C5ISR mission) and capabilities support including evaluating cloud technologies, architectures, and data types and developing an implementation plan.
- e. Provide EW/SIGINT technology development support including designing, building initial prototypes and developing and integrating Passive Electromagnetic Environment (EME) collection capabilities.
- f. Define and develop multiple-Intelligence (multi-INT) activities, transactional data analysis, and problem-solving methodologies through advanced intelligence processing prototypes, modeling, and simulation support.

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- g. Provide cyber technology support including delivering insider threat analysis services to analyze alerts, identify trends, and escalate cases for investigation as well as develop metrics for data exfiltration trends.
- h. Test Cyber Analytic Tools to enforce the protection of all information at rest, in transit, and in use.
- i. Deliver solutions engineering and leverage commercial investments in advancing soldier-borne technologies, increasing lethality, survivability, communications, and data availability in the low-power and bandwidth-constrained MDO tactical edge.

C.5.4.1 SUBTASK 4.1 – MACHINE LEARNING (ML), COGNITIVE COMPUTING, AND ARTIFICIAL INTELLIGENCE (AI) RESEARCH AND DEVELOPMENT (R&D)

This subtask shall provide ML, cognitive computing, and AI R&D including the physical production, engineering, and assessment facilities, serving Government interests, for advancing early assessment, prototyping, and integration analysis of commercial, academic, and Government innovations. This task requires intelligence domain expertise, as well as operational and technical engineering expertise to guide the Government through assessments and analysis.

The contractor shall provide the following ML, cognitive computing, and AI R&D support:

- a. Review and provide analyses and recommendations on Government-provided documentation and requirements for developing a plan of action.
- b. Conduct intelligence domain assessments and analysis.
- c. Assist the Government with collaboration across Government organizations and convergence of intelligence domain expertise with operational and technical engineering.
- d. Assist the Government with developing research plans and requirements to meet R&D objectives, including the identification of data, systems, and skillsets.
- e. Conduct gap analysis and produce mission-centric solutions, scenarios, and prototypes on which the Government can make a decision to support immediate operational needs while facilitating future force development.
- f. Coordinate and collaborate with the Government for the conduct of operational and mission-centric assessments, integration analysis, and prototyping of COTS and Government Off-The-Shelf (GOTS) innovations advancing future force capabilities while maximizing commercial competition.
- g. Perform statistical learning and pattern recognition through unsupervised, supervised, and reinforced ML methods.
- h. Conduct activities to train machines to gain contextual understanding of complex problems through machine intelligence, cognitive computing, and machine reasoning.

C.5.4.2 SUBTASK 4.2 – DECISION DOMINANCE SUPPORT SOLUTIONS

This subtask shall assist in adopting solutions for intelligent, autonomic services across cyber and physical domains. The contractor shall enable solutions that reduce Government risk and accelerate warfighter capabilities using commercial prototypes, proofs of concepts, and solutions. The contractor shall:

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- a. Deliver solutions, concept development, tools provisioning, and resources facilitating the process of the joint fire required for Combined Joint All Domain Operations.
- b. Identify solutions that extend existing tactical intelligence analytic capabilities to the tactical edge, augmenting existing mission systems that minimize operational risks.
- c. Provide AI/ML modular solutions supporting the iterative statistical learning and pattern recognition through unsupervised, supervised, and reinforced ML methods as they apply to ISR, C2, and other warfighting functions.
- d. Provide a solutions architecture that enables modularity and maximizes tactical mission command system options and capabilities for variable mission types.

C.5.4.3 SUBTASK 4.3 – PROCESSING, EXPLOITATION, AND DISSEMINATION (PED)

This subtask shall provide the design, development, integration, and testing of data systems to support full spectrum analytic awareness. The contractor shall provide the following PED mission support:

- a. Research multi-INT ML to automate the fusion of multiple single-Intelligence (single-INT) data sources to provide faster and more comprehensive distributed PED solutions.
- b. Conduct development, integration analysis, and testing to identify and mature emerging PED analytic capabilities from industry, Government, and academia.
- c. Refine, enhance, and transform intelligence PED capabilities across DoD programs.
- d. Provide configuration management and governance for all Infrastructure as a Service (IaaS)-hosted solutions and leverage Activities Based Intelligence (ABI), Structured Object Management (SOM), and Object Based Production (OBP).

C.5.4.4 SUBTASK 4.4 – ADVANCED CLOUD TECHNOLOGY AND CAPABILITIES SUPPORT

This subtask shall support migration efforts for transitioning current cloud architectures. This effort is required to incorporate designated U.S. Army and DoD standards such as IC ITE, Joint Information Environment (JIE), and Defense Intelligence Information Enterprise (DI2E). The contractor shall provide the following advanced cloud technology and capabilities support:

- a. Evaluate cloud technologies, architectures, and data types and develop and test an implementation plan (**Section F, Deliverable 43**) for implementing cloud technologies and capabilities with Enterprise-Scale FoS.
- b. Design, develop prototypes (**Section F, Deliverable 44**), and test new indexing methods capable of parallel query, in-memory indexing, and support for multiple indices capable of indexing more than five million artifacts in less than five hours.
- c. Develop and test high volume, high velocity data ingestion, parsing, and processing system architectures (streaming multimodal sensor data (e.g., MTL, FMV, SIGINT) as well as the ability to execute improvements to streaming data and structured file-based processing.
- d. Develop an approach and execution plan for the Government to work with industry leaders to support the development of technologies in cloud strategy, cloud security, risk management, data analytics cloud application development, and cloud infrastructure and platform services.

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- e. Gather lessons learned from cloud migration efforts upon which the Government can determine if the information/procedures should be applied to future infrastructure, standard migrations, and future innovations.
- f. Contribute to the design, integration analysis, testing, and migration efforts for transiting existing big data and cloud-based architectures into the tactical environments.

C.5.4.5 SUBTASK 4.5 – ELECTRONIC WARFARE (EW)/SIGNALS INTELLIGENCE (SIGINT) TECHNOLOGY DEVELOPMENT

This subtask shall support current systems and evolving systems in the EW/SIGINT domain and require utilizing the NSA technical SIGINT requirements. System engineering support will be required to assist the Government during development of the systems, including providing the means for reaction responses from vendors with unique capabilities in the EW/SIGINT technology development field, including Electronic Attack (EA), Electronic Protection (EP), and EW Support, as well as associated engineering domains including Electrical Engineering, Computer Science, and Radio Frequency (RF) Engineering. This subtask requires contractor network lab support capabilities including support and utilization of testing capabilities and procurement of COTS products.

The contractor shall provide the following EW/SIGINT technology development support:

- a. Decompose EW and SIGINT requirements into specific software design specifications **(Section F, Deliverable 29)** and conduct requirements refinement and specialization of features/specific techniques.
- b. Develop requirements and design and build initial Government approved prototypes **(Section F, Deliverable 44)**.
- c. Define requirements, identify standards and policies, and assist with the transition of technologies to new SIGINT platforms.
- d. Develop and test Passive EME collection capabilities, active programs, and fielded efforts and capabilities required for the full spectrum of Electromagnetic Operational Environment (EMOE) programs and fielding.
- e. Develop and maintain ICD **(Section F, Deliverable 30)**, Interface Design Description (IDD) **(Section F, Deliverable 45)**, system manuals **(Section F, Deliverables 34)**, and configuration guide **(Section F, Deliverables 35)**.

C.5.4.6 SUBTASK 4.6 – ADVANCED INTELLIGENCE PROCESSING PROTOTYPES, MODELING, AND SIMULATION

This subtask shall provide support to multi-INT activities and transactional data analysis and problem-solving methodologies. The contractor shall provide the following advanced intelligence processing prototypes, modeling, and simulation support:

- a. Develop, integrate, test, and secure a prototype concept of tactical-based intelligence systems utilizing ABI service with existing U.S. Army Tactical Intelligence capabilities.
- b. Develop tactical intelligence concepts, use cases, and test scenarios aligned with U.S. Army Tactical Intelligence.
- c. Develop and document a defined set of concepts and methodologies utilizing physical and In-Person systems to meet tactical collection management objectives including, but

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not limited to, asset management, multi-INT collection response, requirements management, and mission management (**Section F, Deliverable 27**).

- d. Maintain an information sharing conduit between Government organizations to test sample data streams, ingestion, annotation, and analytic assessment capabilities between National ABI and ESI supported programs.
- e. Research, design, and develop advanced User Interface (UI) concepts to support enhanced intelligence processing and exploitation across the U.S. Army Tactical enterprise. UI concepts and capabilities shall support tactical intelligence operations in a Disconnected, Intermittent, and Low-bandwidth (DIL) communications environment.
- f. Develop, integrate, test, and document advanced intelligence technologies and incorporate key IC ITE environment frameworks and toolsets within FoS in support of tactical operations.
- g. Produce prototypes designed to reduce technology risks across relevant intelligence domains, which shall be released as part of future competitive procurements, which may or may not be used by companies competing for intelligence programs.
- h. Design and execute Government lab facility upgrades in support of development, integration, and test activities for the software baselines.
- i. Deliver solution services that define, develop, integrate, and test highly complex modeling and simulation capabilities such as Global Positioning System (GPS) constellation modeling and simulation and overlay signals of opportunity.
- j. Deliver solutions that perform analyses, Bayesian Belief Network modeling (identifying conditional dependencies between variables), and evaluation of current operational systems to assess the need for new systems (such as Position, Navigation, and Timing (PNT) or tactical radio devices), and/or analyze proposed PNT systems to determine whether the proposed systems can be expected to meet projected needs/requirements developed by the Government.

C.5.4.7 SUBTASK 4.7 – CYBER TECHNOLOGY RESEARCH AND DEVELOPMENT (R&D)

This subtask shall provide ESI with continued awareness of malicious activity and threat actors and allow for offensive cyber tool development and emerging technological approaches for Electronic Warfare Officers (EWOs) to coordinate multiple EW/Cyber assets. ESI may coordinate and collaborate with National Cyber Centers and DoD Operational Commands. The contractor shall provide the following cyber technology R&D support:

- a. Model and simulate modern attack including kinetic technologies, electromagnetic, physical, and EW/Cyber.
- b. Deliver insider threat analysis services to analyze alerts, identify trends, and escalate cases for investigation as well as develop metrics for data exfiltration trends based on office location and leadership responses to incidents.
- c. Develop, integrate, test, and deploy Cyber Analytic Tools which are not geographically bounded, have flexible cyber with data enrichment, version control, and attribution at the document entity level.
- d. Define real work threat vectors and accurately test prototype or existing hardware to ensure mission readiness.

C.5.4.8 SUBTASK 4.8 – SOLDIER BORNE TECHNOLOGIES

This subtask shall provide soldier-borne technologies support. Soldier-borne technologies are developed to support Soldiers in all operational environments and improve their survivability, protection, mobility, and sustainability by providing safe, agile, adaptive, durable, and operationally effective equipment.

The MDO environment's challenges are technically complex and dynamic. It mandates the ability to collect data, accurately analyze with a quick turnaround, engage the right resource, and act decisively. Solutions development in this environment must address these special missions' complexities. Warfighter performance, data-enabled operations, and human-machine teaming are three areas of solutions development supporting increased warfighter lethality, survivability, and analytic driven decision support required to establish a practical and operational overmatch at the tactical edge.

The contractor shall provide the following:

- a. Deliver solutions engineering and leverage commercial investments in advancing soldier-borne technologies, increasing lethality, survivability, communications, and data availability in the low-power and bandwidth-constrained MDO tactical edge.
- b. Deliver and validate engineering processes and infrastructure to support the advancement of tactical-edge technologies.

C.5.5 TASK 5 – PROTOTYPE USER GUIDE/TRAINING

This task will provide ESI with prototype technical manuals and quick reference guides for new hardware and software equipment and prototype training to support system of systems integration (**Section F, Deliverables 34 and 35**). The contractor shall provide the following prototype user guide/training support:

- a. Develop and update the prototype configuration/interface guides and user guides including, but not limited to, quick reference guides, system configuration guides, system check out guides, post clone guides, and user/technical manuals for the system such that the documents reflect the required configuration as delivered.
- b. Provide prototype training to support system of systems integration.